IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

ASM AMERICA, INC., and
ARTHUR SHERMAN,

Plaintiffs,

v.

GENUS, INC.,

Defendant.
____

GENUS, INC.,

Counterclaimant,

v.

ASM AMERICA, INC., and
ASM INTERNATIONAL, INC.,

Counterdefendants.
_______________________________________/

No. C-01-2190 EDL

ORDER GRANTING GENUS' MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT OF UNITED STATES PATENT NO. 6,015,590 AND AMENDING AUGUST 15, 2002 CLAIM CONSTRUCTION ORDER

In this patent infringement action brought by plaintiffs ASM America, Inc. and Arthur Sherman (jointly, "ASM") against defendant Genus, Inc. ("Genus"), Genus has filed a motion for summary judgment of non-infringement of United States Patent No. 6,015,590 ("the '590 patent"). For the reasons set forth below, Genus' motion is granted.

I. BACKGROUND

Plaintiffs ASM America, Inc. and Arthur Sherman (collectively, "ASM") have filed suit against defendant Genus, Inc. ("Genus") for patent infringement. According to the complaint, ASM invents, manufactures, and sells equipment for use in making integrated circuits. ASM's products include atomic layer chemical vapor deposition ("ALCVD") machines, which are used to form exceptionally thin layers of insulating material, conducting material, and semi-conducting material using a technique generally known as Atomic Layer Deposition ("ALD") or Atomic Layer Epitaxy ("ALE"). Genus allegedly manufactures, offers for sale, and sells ALD process and equipment in competition with ASM's ALCVD process and equipment.

ASM contends that Genus is infringing three patents: the '590 patent, and United States Patents Nos. 5,916,365 ("the '365 patent") and 4,798,165 ("the '165 patent"). ASM alleges that Genus is infringing claims 1 through 10 of the '590 patent, claims 1, 2, 3, 4, 5, 6, 9, 11, 12, 16, and 17 of the '365 patent, and claims 6, 9, 10, and 11 of the '165 patent. Genus has counterclaimed and alleges, among other things, that ASM is infringing one of its patents, United States Patent No. 5,294,568 ("the '568 patent").

The Court issued its claim construction of the '590, '365, and '165 patents on August 15, 2002. The Court issued its claim construction of the '165 patent on November 14, 2002. Under the Court's claim construction of the '365 patent, ASM acknowledged that Genus did not infringe that patent. Accordingly, on November 23, the Court granted Genus' motion for summary judgment of non-infringement of the '365 patent. Genus now moves for summary judgment of non-infringement of the '590 patent.

II. DISCUSSION

A. Summary judgment standard

Rule 56(c) of the Federal Rules of Civil Procedure provides that summary judgment "shall be rendered forthwith if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c). Material facts are those that may affect the outcome of the case. See Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986). A dispute as to a material fact is "genuine" if there is sufficient evidence for a reasonable jury to return a verdict for the nonmoving party. See id. The court may not weigh the evidence. See id. at 255. Rather, the nonmoving party's evidence must be believed and "all justifiable inferences must be drawn in [the nonmovant's] favor." United Steelworkers of Am. v. Phelps Dodge Corp., 865 F.2d 1539, 1542 (9th Cir. 1989) (en banc) (citing Liberty Lobby, 477 U.S. at 255).

The moving party bears the initial responsibility of informing the district court of the basis for its motion and identifying those portions of the pleadings, depositions, interrogatory answers, admissions and affidavits, if any, that it believes demonstrate the absence of a genuine issue of material fact. See Celotex Corp. v. Catrett, 477 U.S. 317, 323 (1986). Where the nonmoving party will bear the burden of proof at trial, the moving party's burden is discharged when it shows the court that there is an absence of evidence to support the nonmoving party's case. See id. at 325.

A party opposing a properly supported motion for summary judgment "may not rest upon the mere allegations or denials of [that] party's pleading, but . . . must set forth specific facts showing that there is a genuine issue for trial." Fed. R. Civ. P. 56(e); Liberty Lobby, 477 U.S. at 250. The opposing party, however, need not produce evidence in a form that would be admissible at trial in order to avoid a summary judgment. See Celotex, 477 U.S. at 324. Nor must the opposing party show that the issue will be resolved conclusively in its favor. See Liberty Lobby, 477 U.S. at 248-49. All that is necessary is sufficient evidence supporting the asserted factual dispute and requiring a jury or judge to resolve the parties' differing versions of the truth at trial. See id.

B. Infringement standard

To prove infringement, the patentee must show that the accused device meets each claim limitation either literally or under the doctrine of equivalents. Catalina Marketing International, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 812 (Fed. Cir. 2002). A determination of infringement, whether literal or under the doctrine of equivalents, is a question of fact. Id.

Literal infringement requires the patentee to prove that the accused device or method contains each limitation of the asserted claim. Id. Summary judgment of no literal infringement is proper when, construing the facts in a manner most favorable to the nonmovant, no reasonable jury could find that the accused device or method meets every limitation recited in the properly construed claims. Id.

Infringement under the doctrine of equivalents requires the patentee to prove that the accused device or method contains an equivalent for each limitation not literally satisfied. Id. An element in the accused device or method is equivalent to a claim limitation if the differences between the two are "insubstantial" to one of ordinary skill in the art. Id. (citing Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 40 (1997)). Insubstantiality may be determined by whether the accused device or method "performs substantially the same function in substantially the same way to obtain the same result" as the claim limitation. Id. at 813 (quoting Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608 (1950)). "Where the evidence is such that no reasonable jury could determine two elements to be equivalent, district courts are obliged to grant partial or complete summary judgment" of non-infringement under the doctrine of equivalents. Warner-Jenkinson, 520 U.S. at 39 n. 8.

C. The Merits

Genus' motion for summary judgment is based entirely on the "evacuation" element of each of the asserted claims of the '590 patent. The Court has previously construed "evacuation" in the context of the'590 patent as follows:

> Evacuation is accomplished by using a vacuum pump to suck the reactant gases out of the reaction space. Evacuation does not encompass using an inert gas to push the reactant gases out of the reaction space. Because the process of the '590 patent always operates in a chamber that is maintained by a vacuum pump at below-atmospheric pressure, evacuation requires that the vacuum pump operate at a higher intensity during the evacuation step. There is no requirement that the pressure drop in the reaction space during evacuation, because the claims of the '590 patent require simultaneously feeding in an inert gas to push the reactant gases out of the reaction space. Whether there is a net pressure drop in the reaction space during evacuation depends on the partial pressure of the reactant gases being vacuumed out of the space compared to the partial pressure of the inert gas being simultaneously injected into the reaction space.

(Order re: Claim Construction of United States Patents Nos. 6,015,590, 5,916,365, and 5,294,568 ("Claim Construction Order") at 57.)

In discussing whether the process of evacuating the reaction space required a pressure drop in the reaction space, the Court explained that:

> It is undisputed that all ALD processes operate in a vacuum. [citation and footnote omitted] In all ALD processes, the vacuum pump is always operating so that the reaction chamber is always at a lower pressure than the outside atmosphere. [citation omitted] Thus, it appears that every flow system includes both a purging gas and a vacuum pump. In order to distinguish flow systems from the system of the '590 patent, it is necessary to distinguish the vacuum used to suck the gases out of the reaction chamber from the ordinary vacuum that is always present in the reaction chamber. The relevant claim language requires "evacuating said reaction space between two successive vapor phase pulses by connecting the reaction space to a pump[.]" ('590 patent 11:53-55.) It appears to the Court that, in the '590 process, the vacuum pump must increase its suction between vapor phase pulses in order to evacuate the reaction space, that is, the vacuum pump operates at different rates at different times in the process.

(Claim Construction Order at 9.)

1. Genus' devices

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Genus argues that its devices do not meet the evacuation limitation of the claims of the ’590 patent because all of Genus’ “ALD tools and processes are flow systems that use a continuous inert gas flow to both carry reactant gases into the chamber and to push them out again.” In addition, Genus argues that its devices do not use a vacuum pump that operates at different rates at different times during the process of removing the reactant gases from the reaction space.

Genus’ expert, James Mason (“Mason”), attests that “[a]ll of the ALD processes run on Genus’ ALD tools are low pressure “flow-type” processes, meaning that they are run at pressures below 1/1000th of an atmosphere, and that there is a continuous flow of an inactive gas (nitrogen or argon) through the system throughout the deposition process.” (Mason Decl. ¶ 3.) Pulses of different reactant gases are introduced into the flow of inactive gas by alternately opening and shutting valves that connect the two reactant gas supply lines to the main inactive gas line. (Mason Decl. ¶ 8.) When the valve for a particular reactant gas is open, the reactant gas joins the flow of inactive gas into the reaction space. (Id.) When the valve is shut, the reactant gas does not flow, but the inactive gas continues to flow into the reaction space. (Id.) The gases flow into the reaction chamber through a nozzle, onto and around the horizontal wafer, and into the exhaust, where they pass through a throttle valve before entering the vacuum pump and being drawn out of the system. (Id. ¶ 4.)

Genus’ ALD tools are designed and instructed to run the deposition cycle at a constant pressure in order to minimize the generation of particles or other contamination in the system. (Id. ¶ 7.) According to Mason, the throttle valve is equipped with a controller that regulates the pressure in the reaction chamber by measuring the pressure in the chamber and then opening or closing the throttle valve to maintain the desired pressure in the reaction chamber. (Id. ¶ 6.)

ASM’s expert, Alexander Glew (“Glew”), disagrees and attests that the throttle valve cannot maintain a constant pressure in the reaction chamber because the response time of the throttle value is longer than the time of a typical reactant pulse. (Glew Decl. ¶ 18.) Thus, “even though the throttle valve may be ‘set’ as a constant pressure, in reality, the throttle valve cannot possibly prevent the significant pressure drop – the evacuation – in the chamber in between the two successive vapor phase reactant pulses.” (Id.)

Mason acknowledges that although Genus’ systems are designed to operate at a constant pressure, some pressure variations do occur. (Mason Decl. ¶ 11.) According to Mason,

> [I]n order to get the reactant gas to flow into the stream of inactive gas when its valve is opened, the pressure of the reactant gas must be kept slightly higher than the pressure of the inactive gas behind the nozzle. Thus, when the valve to a reactant gas is opened to initiate a reactant gas pulse, the pressure behind the nozzle rises very slightly from 17 Torr, as some amount of reactant gas joins the inactive gas flow, and the amount of flow through the nozzle into the chamber (and ultimately out into the vacuum pump) also increases slightly. The converse is also true – when the valve to a reactant gas is closed to stop a pulse, the pressure behind the nozzle drops slightly, and the amount of gas flow through the nozzle, into the chamber and out into the vacuum pump also drops slightly. Thus, while the Genus ALD processes are designed to maintain as close to constant flow as possible, there is a very slight increase in flow during the reactant gas pulses, and a very slight decrease in flow during the purge steps between the reactant gas pulses.

(Mason Decl. ¶ 11.)

According to Glew, these pressure variations are not slight. Glew attests that the pressure actually drops 15% in the reaction chamber in between the pulses of reactant gas. (Glew Decl. ¶ 20.) Ana Londergan, Genus' manager of ALD process development, explained during her deposition that the cause of the pressure drop during the purge step in Genus' process was the inability of the throttle valve to maintain a constant pressure when the flow of reactant gas stops. (Id., and Ex. H (Londergan Dep.) 46:17-47:8.) Thus, Glew disagrees that the Genus device is designed to run at a constant pressure. (Glew Decl. ¶ 22.)

According to Mason, the amount of gas flow through the reaction chamber to the vacuum pump depends on two things: the pressure set point provided to the throttle valve controller (which controls the pressure in the reaction chamber), and the pressure of the incoming gas as it enters the nozzle on the way to the reaction chamber. (Id. ¶ 9.) ASM disagrees. Glew opines, "based on basic principles of fluid dynamics, that the amount of gas flow that passes into the process chamber through the 'nozzle,' which is OR-4 on the schematic, depends on one parameter (assuming all else being equal): the pressure upstream of the 'nozzle.'" (Glew Decl. ¶ 24.) Glew explains that:

> [t]he reason that pressure "set point" provided to the throttle valve has virtually no effect on the amount of flow into the process chamber is because flow through OR-4 is 'choked.' Using choked flow is typical for control valves in the semiconductor industry, so that they are stable and independent of downstream fluctuations.

(Glew Decl. ¶ 24.) Thus, in Glew's view, the amount of flow through the nozzle is independent of the downstream pressure. (Id. ¶ 29.) "Even if the throttle valve was able to rapidly respond to pressure changes during an ALD process cycle – which it cannot – the valve cannot possibly affect the amount of gas that flows into the chamber." (Id.) Because of the use of the choked nozzle, the pressure drops in the gas manifold during the purge step between pulses of reactants. (Id. ¶ 32.)

According to Mason, the vacuum pump runs at a constant speed throughout the process. (Mason Decl. ¶ 5.) It is not controlled in any way during the ALD deposition cycle. (Id. ¶ 15.) It is turned on well before the cycle starts, and is on continuously during the entire ALD deposition cycle. (Id.) ASM agrees with this statement, and further states that this is unremarkable because this is the typical operating mode for all pumps used in semiconductor processing. (Glew Decl. ¶ 16.) Glew attests that:

> I believe there is no pump or pump controller available in semiconductor processing that allows the operator to change the speed of the pump during an ALD deposition cycle, which typically is completed in a matter of seconds. Neither Mr. Mason nor any of the other Genus engineers that were deposed in this matter were able to identify any such pumps, and I have been unable to find one after considerable research. It is my opinion that such a pump or pump controller does not exist today, and certainly did not exist at the time of the '590 patent application or prosecution.

(Glew Decl. ¶ 16.)

In Genus' reply brief, it concedes all of Glew's factual points, but nonetheless argues that its devices do not infringe the '590 patent. "Thus, there is no dispute between the parties about the facts: the dispute is simply whether these facts can possibly support a finding of infringement under the Court's claim construction." (Genus Reply Brief at 2-3.) The Court agrees that the material facts are not in dispute, although the parties' characterization of their significance differs.

2. The Court must amend its claim construction

ASM gently suggests in its opposition brief that the Court erred in its claim construction of "evacuation," particularly in requiring that the vacuum pump operate at a higher intensity during the evacuation step. ASM has not sought leave to file a motion for reconsideration of the Court's claim construction order, as required by Civil Local Rule 7-9. Nonetheless, as the Court is convinced that it did err, it will amend its claim construction.

Neither party argued during claim construction that the vacuum pump must operate at a higher intensity during evacuation. Thus, neither party had reason to bring to the Court's attention the fact that vacuum pumps do not change speed during the deposition process in any ALD system. (Glew Decl. ¶ 16.) As this fact has not been disputed, the Court recognizes that it erred in construing "evacuation" to require that the vacuum pump operate at a higher intensity during evacuation. The Court agrees with ASM that a person of ordinary skill in the art would not understand the ’590 patent to require the use of a vacuum pump that varies its speed during evacuation.

The Court defined “evacuation” to include this limitation in order to distinguish prior art flow systems from the system of the ’590 patent. Each of the claims of the ’590 patent requires both evacuation of the reaction space between two successive vapor pulses and simultaneously feeding an inactive gas into the reaction space. (See, e.g., ’590 patent 11:54-12:4.) The Court was concerned that it needed to distinguish the vacuum used during evacuation from the ordinary vacuum that is always present during ALD processes to keep the reaction chamber below atmospheric pressure, because otherwise the simultaneous use of the vacuum and the inactive gas resembled prior art flow systems.

In retrospect, the Court concludes that its focus was too narrow. ASM correctly points out that there is no requirement that each limitation of a claim be novel for the claim to be patentable. “[I]t is well established that a claim may consist of all old elements and one new element, thereby being patentable.” Clearstream Wastewater Systems, Inc. v. Hydro-Action, Inc., 206 F.3d 1440, 1445 (Fed. Cir. 2000). Evacuating the reaction space and feeding an inactive gas into the reaction space are only two elements of multi-element claims. The other elements of the claims may be sufficient to distinguish the claims of the ’590 patent from the prior art, although the Court makes no such determination now.

Accordingly, the Court finds that it is appropriate to delete from the construction of “evacuation” the limitation that the vacuum pump operate at a higher intensity during evacuation. The Court’s amended claim construction of “evacuation” in the ’590 patent is:

> Evacuation is accomplished by using a vacuum pump to suck the reactant gases out of the reaction space. Evacuation does not encompass using an inert gas to push the reactant gases out of the reaction space. There is no requirement that the pressure drop in the reaction space during evacuation, because the claims of the ’590 patent require simultaneously feeding in an inert gas to push the reactant gases out of the reaction space. Whether there is a net pressure drop in the reaction space during evacuation depends on the partial pressure of the reactant gases being vacuumed out of the space compared to the partial pressure of the inert gas being simultaneously injected into the reaction space.

3. The Court’s order granting Genus’ motion for summary judgment of noninfringement of the ’365 patent does not require the Court to grant summary judgment of noninfringement of the ’590 patent

Genus argues that ASM’s concession that Genus does not infringe the ’365 patent necessarily requires the Court to find that Genus does not infringe the ’590 patent. This argument is unpersuasive.

One key difference between the claim constructions of the ’365 and ’590 patents is that the ’365 patent requires that all gases be evacuated from the reaction space, while the ’590 patent requires only that the reactant gases be evacuated. Because Genus’ process uses a continuous flow of inert gas, the reaction space is never evacuated of all gases, and thus Genus does not infringe the ’365 patent. Determining whether the reactant gases are evacuated from the reaction space requires a different analysis. Thus, Genus’ noninfringement of the ’365 patent does not require a finding of noninfringement of the ’590 patent.

4. Genus’ device does not infringe the ’590 patent

The Court’s claim construction of “evacuation” distinguishes evacuation from purging by making it clear that evacuation is not accomplished by using an inert gas to push the reactant gases out of the reaction space. In order for evacuation to occur, a vacuum pump must suck the reactant gases out of the reaction space. All of the claims of the ’590 patent also require that while the vacuum is sucking the reactant gases out of the reaction space, an inert gas is simultaneously being fed into the reaction space. The ’590 unmistakably requires both evacuation of the reaction space and feeding an inert gas into the reaction space.

Genus argues that its device removes gas from the reaction space only by using a purging inert gas, and not by sucking the gases out of the reaction space with a vacuum. The Court issued the following construction of “reaction space”:

> The reaction space includes the reaction chamber as well as the gas inflow/outflow channels communicating immediately with the reaction chamber and includes the entire volume to be evacuated between two successive vapor-phase pulses.

(Claim Construction Order at 57.) The Court explained that:

> The specification provides that the different reactant gases are not permitted to mix in the inflow channels or in the reaction space. (’590 patent 5:10-15.) In order to prevent this, there must be some sort of valves or baffles on the inflow channels that control the flow of reactant gases into the reaction space. (See, e.g., ’590 patent 6:19-22.) The location of those valves or baffles defines the limit of the reaction space on the input end. The limit of the reaction space on the output end must be either the vacuum pump itself, or any exhaust valve or baffle through which the vacuum pump draws the reactant gases out of the reaction space.

(Id. at 17-18.) Therefore, in Genus’ device, the reaction space must begin at valves ALD-22 and ALD-23 in the gas manifold, continues through the nozzle OR-4, through the showerhead and process chamber, and ends at the throttle valve. (See schematic diagram at Glew Decl., Ex. D.) This is not disputed.

It is also undisputed that the amount of gas that flows through the choked nozzle OR-4 is determined entirely by the pressure of the gas leading into the nozzle, and is not affected at all by the pressure on the output side of the nozzle. (Glew Decl. ¶ 29; Reply Brief at 2-3.) ASM admits that the pressure controller on the throttle valve "cannot possibly affect the amount of gas that flows into the chamber." (Glew Decl. ¶ 29.) Genus agreed with ASM's version of the facts in its reply brief. It is therefore undisputed that the gas manifold containing the gas flow from valves ALD-22 and ALD-23 to nozzle OR-4 can never be evacuated, i.e., sucked out by action of the vacuum pump, because ASM's expert concedes that the vacuum pump leading to the throttle valve does not have any effect on the gas pressure in the gas manifold. The gas manifold thus must be cleared of reactant gases only by the purging inert gas. Accordingly, there is no literal infringement.

There can also be no infringement under the doctrine of equivalents because the claims expressly require that the reaction space be evacuated and that an inert gas be simultaneously fed into the reaction space. It would completely eliminate the patent's own distinction between evacuation and feeding an inert gas if the Court were to find that using an inert gas to clear the reaction space of reactant gases were substantially similar to evacuating that space. See, e.g., Warner-Jenkinson, 520 U.S. at 29 ("It is important to ensure that the application of the doctrine [of equivalents], even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety"); id. at 39 n. 8 ("if a theory of equivalence would entirely vitiate a particular claim element, partial or complete judgment should be rendered by the court"); Dolly, Inc. v. Spalding & Evenflo Co., Inc., 16 F.3d 394, 400 (Fed. Cir. 1994) ("the concept of equivalency cannot embrace a structure that is specifically excluded from the scope of the claims"); Moore U.S.A., Inc. v. Standard Register Co., 229 F.3d 1091, 1107 (Fed. Cir. 2000) (holding that a minority of 48% could not be equivalent to the claimed majority because it would improperly vitiate that claim element). For this reason alone, Genus' summary judgment of non-infringement must be granted. The Court need not reach Genus' other arguments against application of the doctrine of equivalents based on Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 981 (Fed. Cir. 1999) and Wilson Sporting Goods v. David Geoffrey & Associates, 904 F.2d 677, 684 (Fed. Cir. 1990).

Genus' other arguments are less persuasive. Genus argues that the roughly 15% pressure drop in the reaction chamber between pulses of reactant gases cannot constitute evacuation of the reactant gases because the same pressure drop occurs in United States Patents Nos. 4,389,973 and 4,413,022 (the '973 and '022 patents), prior art references that were distinguished by the '590 patent. Genus argues that this pressure drop is inherent in all flow systems. Thus, Genus contends, the '590 patent cannot be interpreted to cover the same ground as these earlier patents. This is mere argument, however, as Genus has presented no declarations on this point. The Court cannot determine, in the absence of expert testimony, whether Genus' device and the inventions of the '973 and '022 patents contain identical pressure drops during evacuation.

Glew attests that Figure 1 of the '022 patent (and also the '973 patent, which derives from the same application as the '022 patent) demonstrates that the process of that patent contemplates that both reactant gases will be in the reaction chamber simultaneously. (Glew Decl. ¶ 38.)

> The '022 patent's reference to "alternately voiding the chamber of each of said substances" does not teach that one should <u>complete</u> the voiding of the first reactant prior to <u>introducing</u> the second reactant into the chamber. Instead, the '022 patent relies on the presence of a "diffusion barrier" that keeps two successive reactant pulses substantially separate from one another. In the method taught by the '022 patent, the second reactant can be introduced to the chamber as soon as a large enough diffusion barrier has been introduced between the two pulses. To the contrary, the '022 patent contemplates that <u>both</u> reactant gases will be in the chamber simultaneously.

(<u>Id</u>.) Thus, Glew contends that the '022 patent and the Genus device are not identical. In addition, the '590 patent states that a problem with prior art methods, such as that described in the '973 patent, is that "the thickness and shape of the diffusion wall become difficult to control and the starting materials may become carried over into contact with each other." ('590 patent 3:5-8.) The reactants cannot come into contact with one another through the diffusion barrier unless they are both in the reaction space at the same time. As Glew attests, "[t]he mere fact that the '022 patent discusses that the two reactant gases can diffuse into the same diffusion barrier illustrates that the two reactant gases will be present in the chamber at the same time – if reactant B were fully voided from the chamber prior to the introduction of reactant A, it would be impossible for the two reactants to have overlapping diffusions into the diffusion barrier." (Glew Decl. ¶ 38.)

On the other hand, during the prosecution of the '022 patent, the applicants stated that one of the patentable features of the invention was "the existence of a reactant-free period during the alternate surface reactions." (Supp. Brown Decl., Ex. M (April 20,1983 Amendment) at '022 FH-0109.) The inventor filed a declaration with the patent office attesting that certain prior art references did not "disclose supplying a gas phase medium to void a reaction chamber of reactants between surface reactions" and that "[s]uch a concept is disclosed in the present application as shown and described with respect to Fig. 1 of the drawings." (Id., Ex. N (April 11, 1983 Suntola Decl.) at '022 FH-0110.) It thus appears that the inventors of the '022 patent disclaimed a process or device in which the reactant gases could mix in the reaction space.

Regardless of whether the Genus device and the inventions of the '022 and'973 patents are similar flow systems, however, Genus has not submitted any evidence, or "pointed out" with sufficient clarity, Celotex, 477 U.S. at 325, that there is a similar pressure drop between pulses of reactants in the reaction chamber in the '022 and '973 processes and in Genus' device. Thus, Genus has not shown that it is entitled to summary judgment on this argument.

Genus also argues that the 15% drop in pressure in the reaction space between pulses of reactants in its device cannot constitute "evacuation" because the pressure drop is not sufficient to evacuate more than 99% of the reactants from the reaction space. Each of the claims of the '590 patent requires that the reaction space be evacuated "by connecting the reaction space to a pump so that substantially all of said reactants remaining in said reaction space and adsorbed on inner walls of said reaction space are removed to a level of less than 1% prior to the inflow of a second pulse of said two successive vapor phase pulses." ('590 patent 11:54-12:3.) Genus points to the ideal gas law, which it contends shows that in a space with a fixed volume and a fixed temperature, the amount of gas in a chamber is linearly proportional to the pressure in the chamber. Thus, according to Genus, if the pressure drops only 15%, only 15% of the gas is removed by virtue of the pressure drop.

Genus fails to support this argument with a declaration from its expert, however. Moreover, Genus' argument fails to take into account the fact that the inert gas continues to flow into the reaction space. As the inert gas is used to push the reactant gases out of the reaction space, the fact that pressure drops only 15% does not necessarily mean that only 15% of the reactant gases are removed. In fact, one would assume that a larger percentage of the reactants are removed and replaced by the inert gas, since the purpose of the inert gas is to push the reactants out of the reaction space. The '590 patent requires that more than 99% of the reactants be removed by evacuation, however, not by using an inert gas to push the reactants out of the reaction space. (Id.) Apart from Glew's testimony about choked flow, neither Genus nor ASM has submitted any expert testimony to explain how to determine whether, or to what extent, gas is being sucked out of the reaction space rather than being pushed out. In addition, Genus has not submitted any evidence that evacuation does not occur in its devices or, if it does occur, the degree to which the reactant gases are evacuated from the reaction space. Accordingly, Genus has failed to demonstrate that it is entitled to summary judgment on this argument.

III. CONCLUSION

For the reasons set forth above,

1. The Court's August 15, 2002 (docket #153) claim construction of "evacuation" in the context of the '590 patent is amended, as follows:

> Evacuation is accomplished by using a vacuum pump to suck the reactant gases out of the reaction space. Evacuation does not encompass using an inert gas to push the reactant gases out of the reaction space. There is no requirement that the pressure drop in the reaction space during evacuation, because the claims of the '590 patent require simultaneously feeding in an inert gas to push the reactant gases out of the reaction space. Whether there is a net pressure drop in the reaction space during evacuation depends on the partial pressure of the reactant gases being vacuumed out of the space compared to the partial pressure of the inert gas being simultaneously injected into the reaction space.

2. Genus' motion for summary judgment of noninfringement of the '590 patent (docket #183) is granted.

IT IS SO ORDERED.

Dated: January __, 2003

ELIZABETH D. LAPORTE
United States Magistrate Judge